155879

U.S. EPA Region III
Central Regional Laboratory
Environmental Services Division
Annapolis, Maryland

ANALYTICAL REPORT

KOPPERS CO. FAC. PLANT (0U2)

SUPERFUND ENFORCEMENT Acct # TGB03NP3C
Lab Request No. REQ95053

March 21, 1995

U.S. EPA Region III
Central Regional Laboratory
Annapolis, Maryland

March 21, 1995

ANALYTICAL RESULTS: KOPPERS CO. FAC. PLANT (0U2) [REQ95053]

Dear Lisa Marino (3HW42),

Enclosed is our analytical report for the above case. It is organized into several sections: Analytical Request and Sample Descriptions, Organic, Inorganic, and Microbiological Results. All data were reviewed by a peer and a laboratory manager.

Analytical Request and Sample Descriptions: (General)
Each laboratory assigned number, station, description, matrix, sample date and locational data is reported. A table summarizes the tests assigned to each sample. A glossary and qualifier code definition is provided.

Inorganic Results:
For requests assigned inorganic tests, results are grouped by service group, e.g., Metals. Sample results are reported; non-detects are provided with the actual quantitation limit. Method description and quality control protocols are described in analyst narratives.

Organic Results:
For the requested organic tests, results are grouped by service group, e.g., Volatile Organic Compounds. Only detected analytes are reported. Nominal Quantitation Limit (NQL) tables are provided for each service group. Specific information for the calculation of Actual Quantitation Limits (AQL) achieved for a given sample is included. Quality control values are provided in summary tables with acceptance criteria. Method description and quality control protocols are described in analyst narratives.

Microbiological Results:
For requests assigned microbiological tests, sample results and quality control values are incorporated into a single table. Method description and quality control protocols are described in analyst narratives.

If you have any questions, please call Rick Dreisch, Laboratory Branch Chief, (410) 573-2646, or Skip Weisberg, Organic Section Chief, (410) 573-2681 or Khin Cho Thaung, Inorganic Section Chief, (410) 573-2680.

Approval for Release:

Frederick Dreisch, Chief (3ES20)
Laboratory Branch

Quality Assurance Review:

Peggy Zawodny, (3ES20)
Quality Control Officer

cc: Brian Marini (TETRA TECH INC.)

AR306464

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Facility: KOPPERS CO. FAC. PLANT (0U2)
Program: SUPERFUND ENFORCEMENT

Batch ID: REQ95053
Account #: TGB03NP3C

SAMPLE DESCRIPTIONS

Sample #	Station, Description	Matrix	Type	End Collection Date	Time	Latitude	Longitude
95020601	STA TB-01, KOP-TB-01	Aqueous Matrix - Type Unspecified	GRAB	02/02/95	09:00		
95020602	STA FB-01, KOP-FB-01	Aqueous Matrix - Type Unspecified	GRAB	02/03/95	09:00		
95020603	STA SB-701A, KOP-SB-701-SS	Bottom Sediment or Deposition	GRAB	02/02/95	09:35		
95020604	STA SB-705A, KOP-SB-705-SS	Bottom Sediment or Deposition	GRAB	02/03/95	09:20		
95020605	STA SB-701B, KOP-SB-701-8-10	Bottom Sediment or Deposition	GRAB	02/02/95	10:00		
95020606	STA SB-705B, KOP-SB-705-6-8	Bottom Sediment or Deposition	GRAB	02/03/95	10:30		

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Facility: KOPPERS CO. FAC. PLANT (OU2)
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TESTS REQUESTED

(X = Test was Requested)

Inorganic Tests Assigned:	Sample No. 950206-														
	01	02	03	04	05	06									
Mercury by Semi-Automated Cold Vapor Technique		X	X	X	X	X									
Metals Analysis		X	X	X	X	X									
Percent Dry Weight at 105 degree C			X	X	X	X									
Percent Dry Weight at 60 degree C			X	X	X	X									

Organic Tests Assigned:	Sample No. 950206-														
	01	02	03	04	05	06									
PCBs and Pesticides by Gas Chromatography		X	X	X	X	X									
Semivolatile Organics by GC/MS		X	X	X	X	X									
Volatile Organic Compounds by Purge and Trap GC/MS	X	X	X	X	X	X									

AR306466

QUALIFIER CODE AND GLOSSARY DEFINITIONS

Qualifier Codes:

<	=	Sample value is below the quantitation limit. Quantitation limit reported.
</=	=	Reported value is estimated. Sample was analyzed in duplicate, one value is equal to or above the quantitation limit and one below. Average of quantitation limit and detected value reported.
>	=	Sample value is above the quantitation range.
A	=	Quality control value is outside acceptance limits.
B	=	Not detected substantially above (10 times) the level reported in the laboratory or field blanks (includes field, trip, rinsate, and equipment blanks).
C	=	See report narrative for analyst's observations concerning this result.
D	=	Sample and duplicate values are below the quantitation limit. Quantitation limit reported.
E	=	Value exceeds a theoretically equivalent or greater value (e.g. dissolved > total, orthophosphate > total phosphorus). However, the difference is within the expected precision of the analytical techniques and is not statistically significant.
I	=	An interference exists which masks true response. See report narrative for explanation.
J	=	Analyte present. Reported value is estimated; concentration is outside the range for accurate quantitation.
K	=	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	=	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
N	=	Presumptive evidence indicates the presence of the compound. Special methods and/or method modifications may be needed to confirm its presence or absence in future sampling efforts.
NA	=	Analysis was not requested.
Q	=	No analytical results. See report narrative for explanation.
R	=	Unreliable results. Analyte may or may not be present in the sample. Supporting data is necessary to confirm results.
T	=	Tentatively identified compound. Identified as a result of a library search using the EPA/NIH Mass Spectral Library. Authentic standards were not available to properly identify and quantitate the compound. The reported concentration is an estimate.
TD	=	Spike recovery too dilute for accurate quantitation.
UJ	=	Not detected. Quantitation limit is estimated.
UL	=	Not detected. Quantitation limit is probably higher.

Glossary:

FD2	=	Field duplicate sample; two environmental samples taken at the same time and place under identical conditions and treated identically in the field and laboratory.
FRB	=	Field blank; a clean sample of the matrix of interest treated like a sample in the field and laboratory. (Exposed to sampling conditions)
LFM	=	Laboratory fortified blank; a known increment of target analyte made to an aliquot of clean sample matrix. The LFM is treated like a sample in the laboratory.
LRB	=	Laboratory reagent blank; an aliquot of reagent water or clean sample matrix treated like a sample in the laboratory.
MS/MSD	=	Matrix spike/matrix spike duplicate; a known increment of target analyte made to a sample before preparation or analysis.
MSA	=	Method of Standard Additions
RIN	=	Equipment/rinsate blank collected in the field to check the cleanliness of sampling devices.
RPD	=	Relative Percent Difference; the results for duplicate analyses are presented as the mean and the relative percent difference.

$$RPD = \frac{|Replicate1 - Replicate2|}{(Replicate1 + Replicate2)/2} \times 100$$

SAM	=	Sample; a portion of the whole or a single item of a group that is representative of the environmental properties conditions of interest.
TRP	=	Trip blank; a clean sample of the matrix of interest that is carried to the sampling site and transported to the laboratory for analysis without being exposed to sampling conditions.
()	=	Numbers in parentheses are analytical spike recoveries (e.g. post-digestion spikes).
[]	=	Numbers in brackets are matrix spike recoveries (e.g. pre-digestion spikes).

(01/05/95)

U.S. EPA Region III
Central Regional Laboratory
Annapolis, Maryland

Environmental Services Division

INORGANIC ANALYTICAL REPORT

KOPPERS CO. FAC. PLANT (0U2)
SUPERFUND ENFORCEMENT Acct # TGB03NP3C
Lab Request No. REQ95053

Signature
Inorganic Review: Khun Ch Ghaury 3/22/95
Section Chief (date)

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Central Regional Laboratory
Annapolis, Maryland

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Facility: KOPPERS CO. FAC. PLANT (0U2)
Program: SUPERFUND ENFORCEMENT

Batch ID: REQ95053
Account #: TGB03NP3C

INORGANIC ANALYTICAL SAMPLE RESULTS

Analytes: | **Sample Number/Units:**

	95020602 FRB			95020603 SAM			95020604 SAM			95020605 SAM		
IN-PHYSICAL				%	%REC	RPD	%	%REC	RPD	%	%REC	RPD
Percent Dry Weight (105C)				80.2		0	84.0			91.9		
Percent Dry Weight (60C)				79.2		2	80.9			90.3		
METALS	ug/L	%REC	RPD	ug/g	%REC	RPD	ug/g	%REC	RPD	ug/g	%REC	RPD
Aluminum	<200			16800		1	16200	(109)		17400		
Antimony	<10			<0.5	(112)	D	<0.5	(112)		<0.5	(99)	
Arsenic	<10			4.0	(MSA)	24	4.8	(MSA)		1.7	(MSA)	
Barium	<200			171		1	132	[105]		116		
Beryllium	<5			1.1		1	0.6	[87]		0.6		
Cadmium	<5			<0.5		D	<0.5	[92]		<0.5		
Calcium	<500			703		4	3350			352	(99)	
Chromium	<10			25.3		4	27.8	[105]		53.6		
Cobalt	<50			9.4		1	7.8	[87]		14.5		
Copper	<25			18.2		2	17.5	[101]		21.6		
Iron	<100			18200		3	23600	(128)		34100		
Lead	<3			15.5		14	35.6	[91]		9.7	(106)	
Magnesium	<500			2300		1	3450	[93]		4390		
Manganese	<15			876		2	249	(101)		346		
Mercury	< 0.2			< 0.1	[91]	D	< 0.1			< 0.1		
Nickel	<40			12.8		0	10.6	[94]		16.6		
Potassium	<1000			1050		2	1660	[106]		4860		
Selenium	<5			<0.5	(100)	D	<0.5	[119]		<0.5	(88)	
Silver	<10			<1.0		D	<1.0	[114]		<1.0		
Sodium	<2000			<100		D	118	[98]		<100		
Thallium	<5			<0.5	(112)	D	<0.5	[99]		<0.5	(MSA)	
Vanadium	<50			31.3		3	42.0	[89]		62.3		
Zinc	<20			69.9		1	67.1	[92]		46.1		

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INORGANIC ANALYTICAL SAMPLE RESULTS

Analytes:	Sample Number/Units: 95020606 SAM ========		
IN-PHYSICAL	**%**	**%REC**	**RPD**
Percent Dry Weight (105C)	91.8		
Percent Dry Weight (60C)	94.2		
METALS	**ug/g**	**%REC**	**RPD**
Aluminum	15300		
Antimony	<0.5	(111)	
Arsenic	5.0	(MSA)	
Barium	150		
Beryllium	<0.5		
Cadmium	<0.5		
Calcium	11200		
Chromium	45.1		
Cobalt	8.7		
Copper	29.0		
Iron	22700		
Lead	490		
Magnesium	8620		
Manganese	289		
Mercury	< 0.1		
Nickel	18.8		
Potassium	2550		
Selenium	<0.5	(MSA)	
Silver	<1.0		
Sodium	271		
Thallium	<0.5	(110)	
Vanadium	42.4		
Zinc	56.2		

METALS DETERMINATIONS

Analysts:

R.T. McClain, Lockheed Chemist
J.L. Molnar, Lockheed Chemist
M.J. Chang, Lockheed Chemist

Methods:

Samples 950206-02 through 950206-06 from Koppers Co. Fac. Plant (OU2) were prepared for analysis by acid digestion and analyzed by furnace atomic absorption spectroscopy and inductively coupled plasma optical emission spectrometry. The following are the digestion and analytical techniques and methods employed:

Digestion Methods

Method from CLP SOW 9/91 revision, p. D-5, A.1. for Furnace AAS (excluding antimony)
Method from CLP SOW 9/91 revision, p. D-5, A.2. for ICP-AES, Flame AAS, and antimony by Furnace AAS
Method 3050, excluding HCl for furnace AAS (excluding antimony) (solid samples) (1)
Method 3050, for ICP-AES, Flame AAS, and antimony by Furnace AAS (solid samples) (1)

Analytical Methods

EPA Method 204.2 and Internal SOP R3-QA132, antimony by Furnace AAS (2)
EPA Method 206.2 and Internal SOP R3-QA132, arsenic by Furnace AAS (2)
EPA Method 239.2 and Internal SOP R3-QA132, lead by Furnace AAS (2)
EPA Method 270.2 and Internal SOP R3-QA132, selenium by Furnace AAS (2)
EPA Method 279.2 and Internal SOP R3-QA132, thallium by Furnace AAS (2)
EPA Method 200.7 and Internal SOP R3-QA132, remaining elements by ICP-AES (2)

(1) SW-846, 2nd Edition, Test Methods for Evaluating Solid Waste Physical /Chemical Methods
(2) 1979/83 EPA Manual of Methods for Chemical Analysis of Water and Wastes

Results for solid samples are reported in ug/g (ppm) **DRY** weight at 60 degrees centigrade. This Percent Dry Weight test pertains only to metals results. The drying temperature of 60 degrees centigrade is selected to retain volatile elements. The Percent Dry Weight (60°C) is reported to allow for conversion to wet weight.

Quality Control:

Samples analyzed in duplicate (method duplicates) are reported as the Mean and the Relative Percent Difference (RPD) of the two analytical values. Routine Quality Control (QC) performed includes preparation and analysis of audit materials; check standards; interference check samples (ICS--for ICP-AES only); method blanks; method spikes; analytical spikes; method duplicates; and analytical duplicates. Calibration standards for ICP-AES are prepared from NIST stock solutions. Calibration standards for Furnace AAS are prepared from Baker stock solutions. Method blanks are prepared with each analytical set and are acceptable if they are found to be below the quantification level for the sample set. Audit materials are analyzed at the beginning of each run to document proper instrument calibration. For ICP-AES the acceptable range is 90-110% recovery; for other techniques it is the 95% confidence interval generated using the True Values and algorithms from EMSL-Cincinnati. Check standards are analyzed periodically (generally a 1/10 frequency) throughout the run to document instrumental stability, and are acceptable at 90-110%. The ICS is obtained from EMSL-Las Vegas and is analyzed at the beginning of each ICP-AES run to document proper selection of analytical lines, background correction factors, and interelement correction factors; it is acceptable at 80-120% recovery. The remaining QC items are sample specific and are performed at a frequency of 1/10 samples for sample sets $\geq$ 10 and 1 per sample set for sample sets <10, except for analytical spikes for Furnace AAS which requires a passing analytical spike or successful Method of Standard Additions for each sample. Acceptance limits for Precision (method and instrumental duplicates) are generated for each element/matrix/analytical procedure using a Shewhart Chart and the most recent 25 duplicate values. Acceptance limits for analytical spikes for Flame AAS and for ICP-AES are generated for 95% confidence intervals for each element/matrix/analytical procedure using the most recent 25 spike recoveries. Acceptance limits for analytical spikes for Furnace AAS are set at 85-115%. Acceptance limits for matrix spikes are 80-120% recovery; when matrix spikes fail an acceptable analytical spike must be prepared and analyzed.

MERCURY DETERMINATIONS

Analyst:

Melanie T. Wilkerson
Chemist/Lockheed

TID #: 03950205

Method:

Samples 950206-02 through 950206-06 from Koppers Co. Fac. Plant (OU2) were analyzed for total mercury using EPA Methods 245.1[1] and 245.5[1].

[1]Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020.

Results for solid samples are reported in ug/g (ppm) **DRY** weight at 60 degrees centigrade. This Percent Dry Weight test pertains only to metals results. The drying temperature of 60 degrees centigrade is selected to retain volatile elements. The Percent Dry Weight (60°C) is reported to allow for conversion to wet weight.

PERCENT DRY WEIGHT DETERMINATIONS

Analyst:

William Pabst, III
Chemist/Lockheed

TID: 03-9502-03

Method:

The soil samples from Koppers Co. Fac. Plant (OU2) site (Batch ID # REQ95053) were analyzed for Percent Dry Weight as required by EPA analytical methods. The samples were dried at 105°C following the procedure outlined in EPA Region III Central Regional Laboratory's SOP #R3QA056.0.

These results are to be used to convert analyte concentrations to a dry weight basis for organic and non-metal analyses. Normally, analytical values are reported on a wet weight basis for organics and non-metals. All metals reported use a 60°C drying temperature for the percent dry weight determinations, as required by the methodology. The 60°C percent dry weight values are reported with the metals results, if applicable.

Weighing dishes used for these samples were sequentially numbered, oven-dried overnight at 105°C, and then cooled in a desiccator before the empty dish weight was recorded. Five to ten grams of each sample was then placed on an empty dish and the total weight recorded. The samples were then placed in an oven and oven-dried overnight at 105°C. When the samples were removed from the oven they were cooled in a desiccator before their weight was recorded for the determination of percent dry weight. All weights were recorded after all appropriate calibration checks were completed on the balance using Class S weights.

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ORGANIC ANALYTICAL REPORT

KOPPERS CO. FAC. PLANT (0U2)
SUPERFUND ENFORCEMENT Acct # TGB03NP3C
Lab Request No. REQ95053

Signature
Organic Review: Susan C. Warner (for CAW) 3/22/95
Section Chief (date)

Facility: KOPPERS CO. FAC. PLANT (0U2)
Program: SUPERFUND ENFORCEMENT

Batch ID: REQ95053
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ORGANIC ANALYTICAL SAMPLE RESULTS

Analytes:	Sample Number:					
	95020601 TRP	95020602 FRB	95020603 SAM	95020604 SAM	95020605 SAM	95020606 SAM
BNA						
NQL FACTOR:		1.075	1	1	1	5
UNITS:		ug/L	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Anthracene						0.2 J
Benzo(B)Fluoranthene				0.09 J,K		0.9 J,K
Benzo(a)Anthracene				0.03 J		0.7 J
Benzo(a)Pyrene				0.04 J,K		0.9 J,K
Benzo(g,h,i)Perylene						0.4 J,K
Benzo(k)Fluoranthene						0.9 J,K
Benzoic Acid		UJ	UJ	UJ	UJ	UJ
Benzyl Alcohol					UJ	
Bis(2-Ethylhexyl)Phthalate				0.1 B	0.2 B	0.3 B
Chrysene				0.06 J		0.8 J
Di-n-Butylphthalate		1 B	0.03 B	0.08 B	0.04 B	
Di-n-Octylphthalate				0.03 J,K		
2,4-Dinitrophenol		UJ	UJ	UJ		UJ
Fluoranthene				0.06 J		1.5 J
Fluorene					UJ	0.3 J
Indeno(1,2,3-cd)Pyrene						0.4 J,K
2-Methylnaphthalene						0.2 J
Phenanthrene				0.04 J		1.1 J
Pyrene				0.08 J		1.78
ORGANICS						
NQL FACTOR:		1	1	1	1	5
UNITS:		ug/L	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Endrin Aldehyde						0.097 R

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ORGANIC ANALYTICAL SAMPLE RESULTS

Analytes:	Sample Number:					
	95020601	95020602	95020603	95020604	95020605	95020606
	TRP	FRB	SAM	SAM	SAM	SAM
VOA						
NQL FACTOR:	1	1	1	1	1	1
UNITS:	ug/L	ug/L	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Acetone	13 B	11 B	6 B	972 C	167 C	852 C
Bromodichloromethane	4 J	4 J				
2-Butanone						8.3
Carbon Disulfide						4 J
Chloroform	45.9	50.6				
Methylene Chloride		3 J	1 B	2 B	2 B	2 B
Naphthalene						2 J
Tetrachloroethene					3 J	
Toluene						2 J
1,2,4-Trimethylbenzene				1 J	1 J	1 J

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ORGANIC QUALITY CONTROL (SURROGATE RECOVERIES)

Surrogates: | Sample Number: | Matrix: SOLIDS

Surrogates:	Surrogate Limits (%)	95020603 SAM (%)	95020604 SAM (%)	95020605 SAM (%)	95020606 SAM (%)
BNA					
2-Fluoro-1,1'-Biphenyl	(30-115)	79	84	92	101
2-Fluorophenol	(25-121)	82	86	78	80
2,4,6-Tribromophenol	(19-122)	61	69	66	73
d14-Terphenyl	(18-137)	112	71	90	83
d5-Nitrobenzene	(23-120)	72	81	78	72
d5-Phenol	(24-113)	74	77	75	78
ORGANICS					
Decachlorobiphenyl	(60-150)	115	119	110	108
Tetrachloro-M-Xylene	(60-150)	106	110	87	111
VOA					
Bromofluorobenzene	(59-113)	93	93	98	90
d4-1,2-Dichloroethane	(70-121)	104	103	101	103
d8-Toluene	(84-138)	102	103	101	108

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ORGANIC QUALITY CONTROL (SURROGATE RECOVERIES)

Surrogates: Sample Number: Matrix: WATER

Surrogate	Limits (%)	95020601 TRP (%)	95020602 FRB (%)
BNA			
2-Fluoro-1,1'-Biphenyl	(43-116)		72
2-Fluorophenol	(21-110)		76
2,4,6-Tribromophenol	(10-123)		62
d14-Terphenyl	(33-141)		138
d5-Nitrobenzene	(35-114)		68
d5-Phenol	(10-110)		75
ORGANICS			
Decachlorobiphenyl	(60-150)		102
Tetrachloro-M-Xylene	(60-150)		102
VOA			
Bromofluorobenzene	(86-115)	98	98
d4-1,2-Dichloroethane	(76-114)	101	103
d8-Toluene	(88-110)	100	100

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ORGANIC Quality Control (Matrix Spike Recoveries)

Matrix Spike Recovery

Matrix: SOLIDS

ORGANICS Matrix Spike Recovery

Compound	Spike Recovery 95020603 MS (%)	Spike Recovery 95020603 MSD (%)	Recovery Limits (SOLIDS) (%)	RPD (%)	RPD Limits (SOLIDS) (%)
Aldrin	93	96	34-132	3	43
4,4'-DDT	115	122	23-134	6	50
Dieldrin	96	102	31-134	7	38
Endrin	124	118	42-139	5	45
Gamma BHC (Lindane)	92	91	46-127	1	50
Heptachlor	110	116	35-130	5	31

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ORGANIC Quality Control (Matrix Spike Recoveries)

BNA Matrix Spike Recovery

Compound	Spike Recovery 95020604 MS (%)	Spike Recovery 95020604 MSD (%)	Recovery Limits (SOLIDS) (%)	RPD (%)	RPD Limits (SOLIDS) (%)
Acenaphthene	83	89	31-137	7	19
4-Chloro-3-Methylphenol	75	80	26-103	6	33
2-Chlorophenol	66	75	25-102	13	50
Di-n-Butylphthalate	72	72	11-117	0	40
1,4-Dichlorobenzene	82	85	28-104	4	27
2,4-Dinitrotoluene	77	85	28-89	10	47
N-Nitroso-di-n-Propylamine	65	72	41-126	10	38
4-Nitrophenol	73	77	11-114	5	50
Pentachlorophenol	11 A	12 A	17-109	9	47
Phenol	56	63	26-90	12	35
Pyrene	83	22	35-142	22	36
1,2,4-Trichlorobenzene	74	90	38-107	20	23

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ORGANIC Quality Control (Matrix Spike Recoveries)

VOA Matrix Spike Recovery

Compound	Spike Recovery 95020606 MS (%)	Spike Recovery 95020606 MSD (%)	Recovery Limits (SOLIDS) (%)	RPD (%)	RPD Limits (SOLIDS) (%)
Benzene	114	117	66-142	3	21
Chlorobenzene	110	114	60-133	4	21
1,1-Dichloroethene	129	127	59-172	2	22
Toluene	121	119	59-139	2	21
Trichloroethene	104	112	62-137	7	24

Central Regional Laboratory - Region III
Extractable Organics Analysis
Nominal Quantitation Limits (NQL)

Units: Solids =mg/kg (wet) NPTC =Non-Priority Pollutant Target Compound

Actual Quantitation Limit =(NQL Factor) X NQL

CAS	ANALYTE	NQL
62-75-9	N-Nitrosodimethylamine	0.33
108-95-2	Phenol	0.33
62-53-34	Aniline NPTC	0.33
111-44-4	bis(2-Chloroethyl)Ether	0.33
95-57-8	2-Chlorophenol	0.33
541-73-1	1,3-Dichlorobenzene	0.33
106-46-7	1,4-Dichlorobenzene	0.33
100-51-6	Benzyl Alcohol NPTC	0.33
95-50-1	1,2-Dichlorobenzene	0.33
95-48-7	2-Methylphenol NPTC	0.33
108-60-1	bis(2-chloroisopropyl)Ether	0.33
106-44-5	4-Methylphenol NPTC	0.33
621-64-7	N-Nitroso-di-n-Propylamine	0.33
67-72-1	Hexachloroethane	0.33
98-95-3	Nitrobenzene	0.33
78-59-1	Isophorone	0.33
88-75-5	2-Nitrophenol	0.33
105-67-9	2,4-Dimethylphenol	0.33
5-85-0	Benzoic Acid NPTC	1.67
.11-91-1	bis(2-Chloroethoxy)Methane	0.33
120-83-2	2,4-Dichlorophenol	0.33
120-82-1	1,2,4-Trichlorobenzene	0.33
91-20-3	Naphthalene	0.33
106-47-8	4-Chloroaniline NPTC	0.33
87-68-3	Hexachlorobutadiene	0.33
59-50-7	4-Chloro-3-Methylphenol	0.33
91-57-6	2-Methylnaphthalene NPTC	0.33
77-47-4	Hexachlorocyclopentadiene	0.33
88-06-2	2,4,6-Trichlorophenol	0.33
95-95-4	2,4,5-Trichlorophenol NPTC	1.67
91-58-7	2-Chloronaphthalene	0.33
88-74-4	2-Nitroaniline NPTC	1.67
131-11-3	Dimethylphthalate	0.33
208-96-8	Acenaphthylene	0.33

CAS NUMBER	ANALYTE	NQL
99-09-2	3-Nitroaniline NPTC	1.67
83-32-9	Acenaphthene	0.33
51-28-5	2, 4-Dinitrophenol	1.67
100-02-7	4-Nitrophenol	1.67
132-64-9	Dibenzofuran NPTC	0.33
606-20-2	2,6-Dinitrotoluene	0.33
121-14-2	2,4-Dinitrotoluene	0.33
84-66-2	Diethylphthalate	0.33
7005-72-3	4-Chlorophenylphenylether	0.33
86-73-7	Fluorene	0.33
100-01-6	4-Nitroaniline NPTC	1.67
86-30-6	N-Nitrosodiphenylamine(1)	0.33
534-52-1	4,6-Dinitro-2-Methylphenol	1.67
101-55-3	4-Bromophenylphenylether	0.33
118-74-1	Hexachlorobenzene	0.33
87-86-5	Pentachlorophenol	1.67
85-01-8	Phenanthrene	0.33
120-12-7	Anthracene	0.33
86-74-8	Carbazole NPTC	0.33
84-74-2	Di-n-Butylphthalate	0.33
206-44-0	Fluoranthene	0.33
92-87-5	Benzidine	1.67
129-00-0	Pyrene	0.33
85-68-7	Butylbenzylphthalate	0.33
91-94-1	3,3'-Dichlorobenzidine	0.67
56-55-3	Benzo(a)Anthracene	0.33
117-81-7	bis(2-Ethylhexyl)Phthalate	0.33
218-01-9	Chrysene	0.33
117-84-0	Di-n-Octylphthalate	0.33
205-99-2	Benzo(b)Fluoranthene	0.33
207-08-9	Benzo(k)Fluoranthene	0.33
50-32-8	Benzo(a)Pyrene	0.33
193-39-5	Indeno(1,2,3-cd)Pyrene	0.33
53-70-3	Dibenzo(a,h)Anthracene	0.33
191-24-2	Benzo(g,h,i)Perylene	0.33

The "Nominal Quantitation Limit" factor is an overall correction factor applied to the method's NQL's for analytical adjustments made during the analysis (i.e., for extractions of more or less than the ideal 30 grams for soil samples, for sample extracts not concentrated to 1.00 ml due to excessive foaming/darkness of the extract, and for sample extract dilutions prior to analysis). For example, the typical NQL factor for a CRL soil sample is 1.5. Therefore, the estimated Actual Quantitation Limit for Phenol would be 0.50 mg/Kg (i.e., 1.5 x .33 mg/Kg).

Cannot be separated from diphenylamine.

Central Regional Laboratory - Region III
Extractable Organics Analysis
Nominal Quantitation Limits (NQL)

Units: Water =ug/L NPTC =Non-Priority Pollutant Target Compound

Actual Quantitation Limit =(NQL Factor) X NQL

CAS	ANALYTE	NQL
62-75-9	N-Nitrosodimethylamine	10
108-95-2	Phenol	10
62-53-34	Aniline NPTC	10
111-44-4	bis(2-Chloroethyl)Ether	10
95-57-8	2-Chlorophenol	10
541-73-1	1,3-Dichlorobenzene	10
106-46-7	1,4-Dichlorobenzene	10
100-51-6	Benzyl Alcohol NPTC	10
95-50-1	1,2-Dichlorobenzene	10
95-48-7	2-Methylphenol NPTC	10
108-60-1	bis(2-chloroisopropyl)Ether	10
106-44-5	4-Methylphenol NPTC	10
621-64-7	N-Nitroso-di-n-Propylamine	10
67-72-1	Hexachloroethane	10
98-95-3	Nitrobenzene	10
78-59-1	Isophorone	10
88-75-5	2-Nitrophenol	10
105-67-9	2,4-Dimethylphenol	10
65-85-0	Benzoic Acid NPTC	50
111-91-1	bis(2-Chloroethoxy)Methane	10
120-83-2	2,4-Dichlorophenol	10
120-82-1	1,2,4-Trichlorobenzene	10
91-20-3	Naphthalene	10
106-47-8	4-Chloroaniline NPTC	10
87-68-3	Hexachlorobutadiene	10
59-50-7	4-Chloro-3-Methylphenol	10
91-57-6	2-Methylnaphthalene NPTC	10
77-47-4	Hexachlorocyclopentadiene	10
88-06-2	2,4,6-Trichlorophenol	10
95-95-4	2,4,5-Trichlorophenol NPTC	50
91-58-7	2-Chloronaphthalene	10
88-74-4	2-Nitroaniline NPTC	50
131-11-3	Dimethylphthalate	10
208-96-8	Acenaphthylene	10

CAS	ANALYTE	NQL
99-09-2	3-Nitroaniline NPTC	50
83-32-9	Acenaphthene	10
51-28-5	2, 4-Dinitrophenol	50
100-02-7	4-Nitrophenol	50
132-64-9	Dibenzofuran NPTC	10
606-20-2	2,6-Dinitrotoluene	10
121-14-2	2,4-Dinitrotoluene	10
84-66-2	Diethylphthalate	10
7005-72-3	4-Chlorophenylphenylether	10
86-73-7	Fluorene	10
100-01-6	4-Nitroaniline NPTC	50
86-30-6	N-Nitrosodiphenylamine(1)	10
534-52-1	4,6-Dinitro-2-Methylphenol	50
101-55-3	4-Bromophenylphenylether	10
118-74-1	Hexachlorobenzene	10
87-86-5	Pentachlorophenol	50
85-01-8	Phenanthrene	10
120-12-7	Anthracene	10
86-74-8	Carbazole NPTC	10
84-74-2	Di-n-Butylphthalate	10
206-44-0	Fluoranthene	10
92-87-5	Benzidine	50
129-00-0	Pyrene	10
85-68-7	Butylbenzylphthalate	10
91-94-1	3,3'-Dichlorobenzidine	20
56-55-3	Benzo(a)Anthracene	10
117-81-7	bis(2-Ethylhexyl)Phthalate	10
218-01-9	Chrysene	10
117-84-0	Di-n-Octylphthalate	10
205-99-2	Benzo(b)Fluoranthene	10
207-08-9	Benzo(k)Fluoranthene	10
50-32-8	Benzo(a)Pyrene	10
193-39-5	Indeno(1,2,3-cd)Pyrene	10
53-70-3	Dibenzo(a,h)Anthracene	10
191-24-23	Benzo (g,h,i)Perylene	10

The "Nominal Quantitation Limit" factor is an overall correction factor applied to the method's NQL's for analytical adjustments made during the analysis (i.e., for extractions of more or less than the ideal 30 grams for soil samples, for sample extracts not concentrated to 1.00 ml due to excessive foaming/darkness of the extract, and for sample extract dilutions prior to analysis). For example, the typical NQL factor for a CRL soil sample is 1. Therefore, the estimated Actual Quantitation Limit for Phenol would be 0.50 mg/Kg (i.e., 1.5 x .33 mg/Kg).

(1) Cannot be separated from diphenylamine.

Central Regional Laboratory - Region III
Pesticide and PCB Analysis
Nominal Quantitation Limits (NQL)

Units: Solids =mg/kg NPTC =Non-Priority Pollutant Target Compound

Actual Quantitation Limit =(NQL Factor) X NQL

CAS Number	Pesticide	NQL
319-84-6	Alpha-BHC	0.002
319-85-7	Beta-BHC	0.002
319-86-8	Delta-BHC	0.002
58-89-8	Gamma-BHC	0.002
76-44-8	Heptachlor	0.002
309-00-2	Aldrin	0.002
1024-57-3	Heptachlor Epoxide	0.002
959-98-8	Endosulfan I	0.002
60-57-1	Dieldrin	0.003
72-55-9	4,4'-DDE	0.003
72-20-8	Endrin	0.003
33213-65-9	Endosulfan II	0.003
72-54-8	4,4'-DDD	0.003
1031-07-8	Endosulfan Sulfate	0.003
50-29-3	4,4'-DDT	0.003
7421-93-4	Endrin Aldehyde	0.003
53494-70-5	Endrin Ketone (NPTC)	0.003
72-43-5	Methoxychlor (NPTC)	0.002
5103-71-9	Alpha-Chlordane	0.002
5103-74-2	Gamma-Chlordane	0.002
57-74-9	Chlordane	0.033
8001-35-2	Toxaphene	0.167

CAS Number	PCB	NQL
12674-11-2	Aroclor-1016	0.033
1104-28-2	Aroclor-1221	0.067
11141-16-5	Aroclor-1232	0.033
53469-21-9	Aroclor-1242	0.033
12672-29-6	Aroclor-1248	0.033
11097-69-1	Aroclor-1254	0.033
11096-82-5	Aroclor-1260	0.033

The "Nominal Quantitation Limit" listed for each target compound is based on the Superfund CLP Protocol. The Actual Quantitation Limits are related to the NQLs by the NQL Factor. This NQL Factor reflects procedural steps, e.g., extract dilution, which influence quantitation limits.

Central Regional Laboratory - Region III
Pesticide and PCB Analysis
Nominal Quantitation Limits (NQL)

Units: Water =ug/L NPTC =Non-Priority Pollutant Target Compound

Actual Quantitation Limit =(NQL Factor) X NQL

CAS Number	Pesticide	NQL
319-84-6	Alpha-BHC	0.05
319-85-7	Beta-BHC	0.05
319-86-8	Delta-BHC	0.05
58-89-8	Gamma-BHC	0.05
76-44-8	Heptachlor	0.05
309-00-2	Aldrin	0.05
1024-57-3	Heptachlor Epoxide	0.05
959-98-8	Endosulfan I	0.05
60-57-1	Dieldrin	0.10
72-55-9	4,4'-DDE	0.10
72-20-8	Endrin	0.10
33213-65-9	Endosulfan II	0.10
72-54-8	4,4'-DDD	0.10
1031-07-8	Endosulfan Sulfate	0.10
50-29-3	4,4'-DDT	0.10
7421-93-4	Endrin Aldehyde	0.10
53494-70-5	Endrin Ketone (NPTC)	0.10
72-43-5	Methoxychlor (NPTC)	0.05
5103-71-9	Alpha-Chlordane	0.05
5103-74-2	Gamma-Chlordane	0.05
57-74-9	Chlordane	1.0
8001-35-2	Toxaphene	5.0

CAS Number	PCB	NQL
12674-11-2	Aroclor-1016	1.0
1104-28-2	Aroclor-1221	2.0
11141-16-5	Aroclor-1232	1.0
53469-21-9	Aroclor-1242	1.0
12672-29-6	Aroclor-1248	1.0
11097-69-1	Aroclor-1254	1.0
11096-82-5	Aroclor-1260	1.0

The "Nominal Quantitation Limit" listed for each target compound is based on the Superfund CLP Protocol. The Actual Quantitation Limits are related to the NQLs by the NQL Factor. This NQL Factor reflects procedural steps, e.g., extract dilution, which influence quantitation limits.

Central Regional Laboratory - Region III
Volatile Organics Analysis
Nominal Quantitation Limits (NQL)

Units: Solids = ug/kg (wet) NPTC = Non-Priority Pollutant Target Compound

Actual Quantitation Limit = (NQL Factor) X NQL

CAS #	ANALYTE		NQL
75-71-8	Dichlorodifluoromethane		5
74-87-3	Chloromethane		5
75-01-4	Vinyl Chloride		5
74-83-9	Bromomethane		5
75-00-3	Chloroethane		5
75-69-4	Trichlorofluoromethane		5
75-35-4	1,1-Dichloroethene		5
75-15-0	Carbon Disulfide	NPTC	5
67-64-1	Acetone	NPTC	5
75-09-2	Methylene Chloride		5
156-60-5	trans-1,2-Dichloroethene		5
75-34-3	1,1-Dichloroethane		5
108-05-4	Vinyl Acetate	NPTC	5
590-20-7	2,2-Dichloropropane		5
156-59-4	cis-1,2-Dichloroethene	NPTC	5
78-93-3	2-Butanone	NPTC	5
74-97-5	Bromochloromethane	NPTC	5
65-66-3	Chloroform		5
71-55-6	1,1,1-Trichloroethane		5
56-23-5	Carbon Tetrachloride		5
563-58-6	1,1-Dichloro-1-propene		5
71-43-2	Benzene		5
107-06-2	1,2-Dichloroethane		5
79-01-6	Trichloroethene		5
78-87-5	1,2-Dichloropropane		5
74-95-3	Dibromomethane	NPTC	5
75-27-4	Bromodichloromethane		5
110-75-8	2-Chloroethylvinyl ether		5
10061-01-6	trans-1,3-Dichloropropene	NPTC	5
108-10-1	4-Methyl-2-pentanone	NPTC	5
108-83-3	Toluene		5
10061-01-5	cis-1,3-Dichloropropene		5
79-00-5	1,1,2-Trichloroethane		5
127-18-4	Tetrachloroethene		5

CAS #	ANALYTE		NQL
142-28-9	1,3-Dichloropropane	NPTC	5
591-78-6	2-Hexanone	NPTC	5
124-48-1	Dibromochloromethane		5
106-93-4	1,2-Dibromoethane(EDB)	NPTC	5
108-90-7	Chlorobenzene		5
630-20-6	1,1,1,2-Tetrachloroethane	NPTC	5
100-41-4	Ethylbenzene		5
108-38-3	m-Xylene	NPTC	5
106-42-3	p-Xylene	NPTC	5
95-47-6	o-Xylene	NPTC	5
100-42-5	Styrene	NPTC	5
75-25-2	Bromoform		5
98-82-8	Isopropylbenzene	NPTC	5
108-86-1	Bromobenzene	NPTC	5
79-34-5	1,1,2,2-Tetrachloroethane		5
96-18-4	1,2,3-Trichloropropane	NPTC	5
103-65-1	n-Propylbenzene	NPTC	5
95-49-8	2-Chlorotoluene	NPTC	5
106-43-4	4-Chlorotoluene	NPTC	5
108-67-8	1,3,5-Trimethylbenzene	NPTC	5
98-06-6	tert-Butylbenzene	NPTC	5
93-63-6	1,2,4-Trimethylbenzene	NPTC	5
135-98-8	sec-Butylbenzene	NPTC	5
541-73-1	1,3-Dichlorobenzene		5
106-46-7	1,4-Dichlorobenzene		5
99-87-6	p-Isopropyltoluene	NPTC	5
95-50-1	1,2-Dichlorobenzene		5
104-51-8	n-Butylbenzene	NPTC	5
96-12-8	1,2-Dibromo-3-chloropropane		5
120-82-1	1,2,4-Trichlorobenzene		5
91-20-3	Naphthalene		5
87-68-3	Hexachlorobutadiene		5
87-61-6	1,2,3-Trichlorobenzene	NPTC	5

The "Nominal Quantitation Limit" factor is an overall correction factor applied to the method's NQLs for analytical adjustments made during the analysis (i.e., for analyses of more or less than the ideal 5 grams for soil samples, and for sample dilutions prior to analysis). For example, if the NQL factor for a CRL soil sample is 2, the estimated Actual Quantitation Limit for vinyl chloride would be 10 ug/kg (i.e., 2 x 5 ug/Kg).

Central Regional Laboratory - Region III
Volatile Organics Analysis
Nominal Quantitation Limits (NQL)

Units: Water = ug/L NPTC = Non-Priority Pollutant Target Compound

Actual Quantitation Limit = (NQL Factor) X NQL

CAS #	ANALYTE		NQL
75-71-8	Dichlorodifluoromethane		5
74-87-3	Chloromethane		5
75-01-4	Vinyl Chloride		5
74-83-9	Bromomethane		5
75-00-3	Chloroethane		5
75-69-4	Trichlorofluoromethane		5
75-35-4	1,1-Dichloroethene		5
75-15-0	Carbon Disulfide	NPTC	5
67-64-1	Acetone	NPTC	5
75-09-2	Methylene Chloride		5
156-60-5	trans-1,2-Dichloroethene		5
75-34-3	1,1-Dichloroethane		5
108-05-4	Vinyl Acetate	NPTC	5
590-20-7	2,2-Dichloropropane		5
156-59-4	cis-1,2-Dichloroethene	NPTC	5
78-93-3	2-Butanone	NPTC	5
74-97-5	Bromochloromethane	NPTC	5
65-66-3	Chloroform		5
71-55-6	1,1,1-Trichloroethane		5
56-23-5	Carbon Tetrachloride		5
563-58-6	1,1-Dichloro-1-propene		5
71-43-2	Benzene		5
107-06-2	1,2-Dichloroethane		5
79-01-6	Trichloroethene		5
78-87-5	1,2-Dichloropropane		5
74-95-3	Dibromomethane	NPTC	5
75-27-4	Bromodichloromethane		5
110-75-8	2-Chloroethylvinyl ether		5
10061-01-6	trans-1,3-Dichloropropene	NPTC	5
108-10-1	4-Methyl-2-pentanone	NPTC	5
108-83-3	Toluene		5
10061-01-5	cis-1,3-Dichloropropene		5
79-00-5	1,1,2-Trichloroethane		5
127-18-4	Tetrachloroethene		5

CAS #	ANALYTE		NQL
142-28-9	1,3-Dichloropropane	NPTC	5
591-78-6	2-Hexanone	NPTC	5
124-48-1	Dibromochloromethane		5
106-93-4	1,2-Dibromoethane(EDB)	NPTC	5
108-90-7	Chlorobenzene		5
630-20-6	1,1,1,2-Tetrachloroethane	NPTC	5
100-41-4	Ethylbenzene		5
108-38-3	m-Xylene	NPTC	5
106-42-3	p-Xylene	NPTC	5
95-47-6	o-Xylene	NPTC	5
100-42-5	Styrene	NPTC	5
75-25-2	Bromoform		5
98-82-81	Isopropylbenzene	NPTC	5
108-86-1	Bromobenzene	NPTC	5
79-34-5	1,1,2,2-Tetrachloroethane		5
96-18-4	1,2,3-Trichloropropane		5
103-65-1	n-Propylbenzene	NPTC	5
95-49-8	2-Chlorotoluene	NPTC	5
106-43-4	4-Chlorotoluene	NPTC	5
108-67-8	1,3,5-Trimethylbenzene	NPTC	5
98-06-6	tert-Butylbenzene	NPTC	5
93-63-6	1,2,4-Trimethylbenzene	NPTC	5
135-98-8	sec-Butylbenzene	NPTC	5
541-73-1	1,3-Dichlorobenzene		5
106-46-7	1,4-Dichlorobenzene		5
99-87-6	p-Isopropyltoluene	NPTC	5
95-50-1	1,2-Dichlorobenzene		5
104-51-8	n-Butylbenzene	NPTC	5
96-12-8	1,2-Dibromo-3-chloropropane		5
120-82-1	1,2,4-Trichlorobenzene		5
91-20-3	Naphthalene		5
87-68-3	Hexachlorobutadiene		5
87-61-6	1,2,3-Trichlorobenzene	NPTC	5

The "Nominal Quantitation Limit" factor is an overall correction factor applied to the method's NQLs for analytical adjustments made during the analysis (i.e., for analyses of more or less than the ideal 5 grams for soil samples, and for sample dilutions prior to analysis). For example, if the NQL factor for a CRL water sample is 2, the estimated Actual Quantitation Limit for vinyl chloride would be 10 ug/L (i.e., 2 x 5 ug/L).

Facility: KOPPERS CO. FAC. PLANT (0U2) **Batch ID:** REQ95053
Program : SUPERFUND ENFORCEMENT **Account #:** TGB03NP3C

LRB RESULTS REPORT

Service Group : BNA

Instrument Run: OI953131

Control Type	Event Number
LRB	8

Analyte	Correction Factor	Final Result	Units
2-Fluorophenol	1	73	% REC
d5-Phenol	1	69	% REC
d5-Nitrobenzene	1	71	% REC
2-Fluoro-1,1'-Biphenyl	1	67	% REC
2,4,6-Tribromophenol	1	68	% REC
d14-Terphenyl	1	71	% REC
Benzoic Acid	1	UJ	ug/L
2,4-Dinitrophenol	1	UJ	ug/L
Di-n-Butylphthalate	1	0.8 J	ug/L

Control Type	Event Number
LRB	9

Analyte	Correction Factor	Final Result	Units
2-Fluorophenol	1	74	% REC
d5-Phenol	1	71	% REC
d5-Nitrobenzene	1	66	% REC
2-Fluoro-1,1'-Biphenyl	1	78	% REC
2,4,6-Tribromophenol	1	56	% REC
d14-Terphenyl	1	110	% REC
Benzoic Acid	1	UJ	mg/Kg
2,4-Dinitrophenol	1	UJ	mg/Kg
Diethylphthalate	1	0.2 J	mg/Kg
Di-n-Butylphthalate	1	0.09 J	mg/Kg
Bis(2-Ethylhexyl)Phthalate	1	0.03 J	mg/Kg

Facility: KOPPERS CO. FAC. PLANT (0U2) **Batch ID:** REQ950
Program : SUPERFUND ENFORCEMENT **Account #:** TGB03N

LRB RESULTS REPORT

Service Group : ORGANICS

Instrument Run: OC950206

Control Type	Event Number
LRB	1

Analyte	Correction Factor	Final Result	Units
Tetrachloro-M-Xylene	1	106	% REC
Decachlorobiphenyl	1	121	% REC

Instrument Run: OC950208

Control Type	Event Number
LRB	1

Analyte	Correction Factor	Final Result	Units
Tetrachloro-M-Xylene	1	91	% REC
Decachlorobiphenyl	1	98	% REC

Facility: KOPPERS CO. FAC. PLANT (0U2) **Batch ID:** REQ95053
Program : SUPERFUND ENFORCEMENT **Account #:** TGB03NP3C

LRB RESULTS REPORT

Service Group : VOA

Instrument Run: OH95216A

Control Type	Event Number
LRB	1

Analyte	Correction Factor	Final Result	Units
d4-1,2-Dichloroethane	1	103	% REC
d8-Toluene	1	102	% REC
Bromofluorobenzene	1	98	% REC
Acetone	1	4 J	ug/L

Control Type	Event Number
LRB	2

Analyte	Correction Factor	Final Result	Units
d4-1,2-Dichloroethane	1	100	% REC
d8-Toluene	1	98	% REC
Bromofluorobenzene	1	99	% REC
Methylene Chloride	1	1 J	ug/L
2-Chloroethylvinyl Ether	1	UJ	ug/L

GC/MS EXTRACTABLE ANALYSIS

Analyst:

Hoang Nguyen
Chemist/Lockheed

TID #: 03950207

Method:

The one aqueous (1) and four (4) soil samples from the Koppers Co. Fac. Plant (OU2) site were analyzed for the presence of organic compounds listed as extractable Priority Pollutants and CLP Hazardous Substances List Compounds. The samples were collected on February 02 and 03, 1995. The aqueous sample was extracted by the continuous liquid/liquid extraction method on February 09, 1995. The soil samples were extracted by the sonication method on February 09, 1995. These samples were analyzed on February 22 and March 02, 1995 following SOP# R3-QA211.0. This SOP is a consolidated method derived from the Superfund Contract Laboratory Program Statement of Work and from RCRA methodology (SW-846). Instrumentation utilized consisted of a Hewlett Packard (HP) 5970 MSD coupled to a HP 5890 Series II gas chromatograph equipped with an HP-7673A auto-sampler and SPB-5 30 meter capillary column. Concentrations of compounds were determined using the relative response of authentic standards to the closest internal standard. The soil concentration results are reported on a **wet** weight basis. These values have been reported in the RLIMS Final Report. Only those compounds for which results are reported were detected. Sample target compound values outside the calibration range were labeled with a "J". This indicates that the mass spectrum obtained for the sample met the identification criteria, yet the quantity present was outside the range for which the instrument accurately quantitates. All results qualified with a "J" are estimated quantities. The NQLs (nominal quantitation limits) are the quantitation limits that have been determined for each parameter analyzed by this method. The actual quantitation limit for a sample reflects the NQL as well as any dilution/concentration factor specific for each sample. The NQL factor for all samples is equal to 1, except for samples 950206-02 and 950206-06. Sample 950206-02 has an NQL factor of 1.075 due to lack of sample volume for extraction, and sample 950206-06 has an NQL factor of 5 because the final sample extract could be concentrated only to a 5 ml final volume.

The samples were also examined for the presence of compounds in addition to those on the Target Compound list. Authentic standards were not available to verify these tentatively identified compounds (TIC) results. Tentative identification of these compounds was made by the comparison of sample spectra to the EPA/NBS54K Mass Spectral Library. Concentrations for these compounds were estimated based on the response of the closest internal standard and the assumption that the instrument response for a given tentative compound was the same as the instrument response for the internal standards. These identifications have been reported as tentative identifications with the associated quantitation values reported as estimated concentrations and qualified with a "T". The TICs in all sample extracts have been corrected for any blank contamination.

Quality Control:

Before acquisition of any sample data, the mass spectrometer is calibrated using FC43. The calibration is verified by obtaining the spectrum of a known compound (DFTPP). All mass assignments and relative abundances are found to be in acceptable ranges or the instrument is adjusted until an acceptable spectrum of the known is obtained.

Immediately before analysis, each sample is spiked with an internal standard mix obtained commercially containing D4-1,4-dichlorobenzene, D8-naphthalene, D10-acenaphthene, D10-phenanthrene, D12-chrysene and D12-perylene. All quantitations or estimates of concentration are made in comparison to the internal standard nearest to the compound of interest.

The sixth internal standard area recovery for samples 950206-03, 950206-04 and 950206-06 was low due to matrix effect as confirmed by similar results in the QC analyses and sample reinjections. The results for all compounds detected with reference to the affected internal standard were qualified "K".

Quantitation was based on the 50 ng/ul standard. The initial calibration consisted of a five (5) point calibration (10, 20, 50, 80 and 100 ng/ul), except for benzoic acid, 2,4-dinitrophenol, 4-nitrophenol, 4,6-dinitro-2-methylphenol and pentachlorophenol (February 13 and March 02, 1995) which consisted of a four (4) point calibration (20, 50, 80 and 100 ng/ul). The percent relative standard deviation (%RSD) for all compounds (except for benzoic acid and 2,4-dinitrophenol on 02/13/95, and benzyl alcohol and fluorene on 03/02/95) in the initial calibration of the instrument was below thirty (30) percent. The percent difference (%D) for all compounds (except benzoic acid on 03/02/95) in the continuing calibration curve was below twenty-five (25) percent for this case. These compounds are qualified "J", estimated, for the positive results and "UJ", undetected estimated, for non-detected results in the affected samples.

For each group of samples extracted, a method blank is prepared and examined for laboratory introduced contamination. Only target compounds in the samples with values less than or equal to ten times (<10X) the method blank, field blank, rinsate blank and/or equipment blank are reported with a "B" qualifier.

The samples were spiked with a mixture of six (6) surrogate compounds prior to extraction. Recovery for each was determined to check for extraction efficiency. All surrogate recoveries were within Q.C. limits. The target limits are those established for the CLP.

Two (2) aliquots of sample 950206-04 were spiked with a priority pollutant cocktail mix containing twelve compounds at 100 ng/uL for acid and 50 ng/uL for base/neutral (in the extract) and carried through the extraction and GC/MS. Recovery for each was determined to check for sample matrix effect. Twenty-two (22) out of twenty-four (24) matrix spike recoveries and all %RPDs were within acceptable limits. The outliers were qualified "A".

TENTATIVELY IDENTIFIED COMPOUNDS

Site: Koppers Co. Fac. Plant (OU2)
Program: Superfund Enforcement

UNITS: ug/L

SAMPLE NO.	CAS #	TIC NAME	RT	CONC
950206-02		None Detected		

UNITS: mg/Kg

SAMPLE NO.	CAS #	TIC NAME	RT	CONC
950206-03	******	Unknown m/z = 43	9.08	0.2 T
	******	Unknown m/z = 43	10.62	0.2 T
	******	Unknown m/z = 43	20.78	0.1 T
	******	Unknown m/z = 43	29.57	0.2 T
	******	Unknown m/z = 43	30.53	0.2 T
	******	Unknown alkane m/z = 43	30.99	0.2 T
	******	Unknown alkane m/z = 43	32.78	0.3 T
	******	Unknown m/z = 43	34.49	0.1 T
	******	Unknown alkane m/z = 57	35.21	0.2 T
	******	Unknown m/z = 43	38.43	0.2 T
	******	Unknown m/z = 204	39.34	0.7 T
	******	Unknown m/z = 43	40.62	0.4 T

UNITS: mg/Kg

SAMPLE NO.	CAS #	TIC NAME	RT	CONC
950206-04	******	Unknown m/z = 41	6.02	0.2 T
	******	Unknown m/z = 43	9.07	0.3 T
	******	Unknown m/z = 41	9.61	8 T
	******	Unknown m/z = 43	10.63	0.3 T
	******	Unknown m/z = 43	40.62	0.5 T

UNITS: mg/Kg

SAMPLE NO.	CAS #	TIC NAME	RT	CONC
950206-05	******	Unknown m/z = 39	8.21	0.2 T

UNITS: mg/Kg

SAMPLE NO.	CAS #	TIC NAME	RT	CONC
950206-06	******	Unknown m/z = 154	17.97	0.7 T
	******	Unknown m/z = 170	18.27	1 T
	******	Unknown m/z = 189	25.17	0.7 T

VOA ANALYSIS BY GC/MS

Analyst:

Sue Raupuk
Chemist/Lockheed

TID #: 03950206

Method:

Two (2) aqueous and four (4) soil samples from Koppers Co. Fac. Plant (OU2) were analyzed for the presence of volatile organic compounds amenable to purge and trap and identifiable by mass spectrometry. Samples were collected on February 2 & 3, 1995 and analyzed on February 6 & 9, 1995 following SOP #R3-QA210. This SOP is derived from the Superfund Contract Laboratory Program Statement of Work and from RCRA methodology (SW-846). Instrumentation utilized consisted of a purge and trap apparatus (Tekmar ALS 2016/LSC 2000) interfaced to a gas chromatograph/mass spectrometer (HP 5890/HP 5970) equipped with a fused silica capillary column (VOCOL 105m x 0.53mm ID x 3.0um film thickness). Concentrations of compounds were determined using the relative response of authentic standards to the closest internal standard. Only detected results are reported. Sample target compound values outside the calibration range were labeled with a "J". This indicates that the mass spectrum obtained for the sample met the identification criteria, yet the quantity present was outside the level for which the instrument accurately quantitates. All results qualified with a "J" are estimated quantities. The NQLs (nominal quantitation limits) are the quantitation limits that have been determined for each parameter analyzed by this method. The actual quantitation limit is the NQL multiplied by a factor specific for each sample. The NQL factor is equal to 1 except for parameters reported after sample dilution. The "C" qualifier was applied to all results reported from dilutions. The following samples were diluted as follows to bring the listed target compound within calibration range:

Sample	Compound	Dilution	NQL Factor
950206-04	acetone	25X	25
950206-05	acetone	5X	5
950206-06	acetone	5X	5

Sample 950206-04 required a medium level extraction with 5 gms sample/5 ml methanol to minimize the amount of methanol injected into the instrument; 200 ul of extract was utilized for analysis to result in a 25X dilution of the sample. A 50 ppb check standard prepared with 200 ul of methanol was utilized for the quantitation of acetone in this sample.

Soil sample results were uncorrected for % dry weight and reported on a **WET** weight basis.

The samples were also examined for the presence of compounds in addition to those on the Target Compound list. Authentic standards were not available to verify these tentatively identified compound (TIC) results. Tentative identification of these compounds was made on the comparison of sample spectra to the EPA/NBS54K Mass Spectral Library. Concentrations for these compounds were estimated based on the response of the closest internal standard and the assumption that the instrument response for a given tentative compound was the same as the instrument response for the internal standards. These identifications have been reported as tentative identifications with the associated quantitation values reported as estimated concentrations and qualified with a "T".

Quality Control:

Before acquisition of any sample data, the mass spectrometer is calibrated using FC43. The calibration is verified by obtaining the spectrum of a known compound (BFB). All mass assignments and relative abundances are found to be in acceptable ranges or the instrument is adjusted until an acceptable spectrum of the known is obtained. All samples and related Q.C. were analyzed within the twelve hour BFB time criteria.

Immediately before analysis, each sample is spiked with internal standards obtained commercially. All quantitations or estimates of concentrations are made in comparison to the internal standard nearest to the compound of interest. Initial analysis for sample 950206-06 demonstrated slightly depressed internal standard areas but were within criteria limits. Some of the MS/MSD internal standard areas for this sample were outside the limits, however all Q.C. was within criteria limits. The subsequent 5X dilution of this sample was not affected.

The initial calibration consisted of a five-point calibration curve (5, 10, 50, 100 and 200 ug/L standards). Five (5) milliliters of aqueous sample and five (5) grams of soil sample for the heated method were purged. The daily calibration check standard was analyzed at a concentration of 50 ppb. The NQL for acetone was 10 ppb.

For each day of sample analysis, a method blank (lab reagent blank - LRB) was prepared and examined for laboratory introduced contamination. All compounds which were found in both a LRB, trip or field blank and a sample were qualified "B" if the concentration of the compound in the sample was less than ten times (<10X) the compound's concentration in the blank.

The percent relative standard deviation (%RSD) for all compounds in the initial calibration of the instrument on February 3, 1995 was below thirty (30) percent. The percent difference (%D) for all compounds in the continuing calibration standard on February 6, 1995 was below twenty-five (25) percent when comparing the daily calibration standard to the initial calibration. The percent difference (%D) for all compounds in the continuing calibration standard on February 9, 1995 were below twenty-five (25) percent when comparing the daily calibration standards to the initial calibration curve except for 2-chloroethylvinylether.

The samples were spiked with a mixture of surrogate compounds prior to analysis. Recovery for each was determined to check for matrix interferences. The target limits are those established by the CLP. All surrogate recoveries were within acceptable recovery limits.

Two (2) aliquots of soil sample 950206-06 were spiked with 5 ul of the matrix spike mix containing all spike compounds at a concentration of 50 ppb. The recovery for each compound was determined to check for matrix effect. Recoveries have been corrected for target compounds present in the sample. The target limits are those established by the CLP. All MS/MSD recoveries and RPDs were within CLP target limits.

TENTATIVELY IDENTIFIED COMPOUNDS

Site: Koppers Co. Fac. Plant (OU2)
Program: Superfund Enforcement

SAMPLE NO.	CAS #	TIC NAME	SCAN	CONC. (ug/L)
950206-01		None Detected		

SAMPLE NO.	CAS #	TIC NAME	SCAN	CONC. (ug/L)
950206-02		None Detected		

SAMPLE NO.	CAS #	TIC NAME	SCAN	CONC. (ug/Kg)
950206-03	******	Unknown, m/z = 281	2133	5 T
	******	Unknown, m/z = 73	2527	20 T

SAMPLE NO.	CAS #	TIC NAME	SCAN	CONC. (ug/Kg)
950206-04	******	Unknown, m/z = 73	2525	25 T

SAMPLE NO.	CAS #	TIC NAME	SCAN	CONC. (ug/Kg)
950206-05	127004	2-Propanol, 1-chloro-	811	510 T
	1120214	Undecane	2282	8 T
	******	Unknown, m/z = 73	2528	9 T
	17312822	Undecane, 4,6-dimethyl-	2560	7 T
	******	Unknown, m/z = 41	2724	7 T

SAMPLE NO.	CAS #	TIC NAME	SCAN	CONC. (ug/Kg)
950206-06	127004	2-Propanol, 1-chloro-	801	91 T
	541059	Cyclotrisiloxane, hexamethyl-	1658	10 T
	16538935	Cyclooctane, butyl-	1854	10 T
	******	Unknown, m/z = 55	2024	8 T
	******	Unknown, m/z = 55	2102	9 T
	556672	Cyclotetrasiloxane, octamethyl-	2129	40 T
	******	Unknown, m/z = 57	2278	14 T
	******	Unknown, m/z = 43	2332	7 T
	******	Unknown, m/z = 41	2445	9 T
	******	Unknown, m/z = 73	2524	55 T
	******	Unknown, m/z = 41	2720	20 T
	******	Unknown, m/z = 41	2994	8 T

PCB/PESTICIDE ANALYSIS BY GC

Analyst:

Timothy M. Casey
Chemist/Lockheed

Method:

The samples from Koppers Co. Fac. Plant were analyzed by capillary column gas chromatography for polychlorinated biphenyls and organochlorine pesticides listed on the priority pollutants compound list. The samples were collected on February 2 and 3, 1995. The extractions of the aqueous samples were performed on February 8, 1995. Approximately one liter of each aqueous sample was extracted between eighteen and twenty-four hours with methylene chloride by continuous liquid-liquid extraction. Each extract was subsequently reduced to 10 mL in hexane using Kuderna-Danish flasks. The extractions of the soil samples were performed on February 6, 1995. Approximately 15 gram portions of each soil sample were weighed, and the soil extracted by soxhlet in a 1:1 mixture of hexane and acetone. Each extract was subsequently reduced to 5 mL in hexane using Kuderna-Danish flasks. The extractions and analyses were performed according to SOP R3-QA207.0. This SOP is a consolidated method derived from the Superfund CLP Statement of Work.

Analysis of all sample extracts began on February 13, 1995 and continued until February 16, 1995. All sample extracts were analyzed on a Hewlett-Packard 5890 gas chromatograph (GC) equipped with an automatic injector and dual electron capture detectors (ECDs). All samples, standards, and laboratory control solutions were run on dual columns connected by an injector port tee. The fused silica capillary column connected to the front ECD was a J&W Scientific DB-608 (30 m., 0.53 mm ID). The fused silica capillary column connected to the rear ECD was a Restek Rtx-1701 (30 m., 0.53 mm ID). Data were obtained from these analyses using the Millennium data acquisition and processing software. Since both the front and rear columns were fully calibrated during analyses, the lower of the results from the two columns was used for reporting.

Identification of organochlorine pesticides was accomplished by comparing retention times of known pesticides with the peaks observed in the sample extract chromatograms. A retention time window of 1% of the retention time of the standard chromatogram was used for identification of target compounds. Identification of PCBs was accomplished by matching the profile of known PCBs with patterns exhibited in the target sample chromatograms. Quantitation of multi-responding compounds was based on the average of several calibrated peaks. The quantitation of all surrogate compounds and target analytes was based on a five-point linear regression where the correlation coefficient is greater than 0.995 for pesticides, and on a three-point linear regression where the correlation coefficient is greater than 0.995 for PCBs.

The NQLs (nominal quantitation limits) are the quantitation limits that have been determined for each compound analyzed by this method. The actual quantitation limit is the NQL multiplied by an NQL factor specific for each sample. The NQL factors for each sample are listed elsewhere in the report.

All soil results are reported on a **WET WEIGHT** basis.

Quality Control:

The two fused silica capillary columns of the HP5890 Gas Chromatograph were calibrated with five levels of the certified pesticide standards. A breakdown check standard and a mid-level check standard were analyzed concurrent with sample analyses. To monitor instrument stability, each sample sequence was interspersed with mid-level check standards and ended with a mid-level check standard. If initial and/or continuing calibration check criteria are not

satisfied for a particular analyte on one column, quantitation of that analyte will be performed using the other column (assuming valid linearity). If linearity cannot be achieved on either column, the problem will be addressed, and a new curve will be generated.

A representative standard or a three-point calibration for toxaphene and each PCB was analyzed at the beginning of the analytical sequence for pattern recognition or quantitation. The injection volume was 3 uL for the standards, samples, and quality control solutions. An automatic sampler (HP 7673A) was used for injection.

Continuing calibration criteria were monitored for target pesticides. All continuing calibration check standards met acceptance criteria.

Due to the complex nature of the sample matrix, non-target interference peaks may be eluting within pesticide retention time windows. Target analyte results with relative percent difference greater than 25% between the two analytical columns may be considered suspect and have been flagged with a "R".

Surrogates tetrachloro-meta-xylene (TMX) and decachlorobiphenyl (DCBP) were added to all target samples and quality control samples. With each sample set, a laboratory blank and matrix spikes (in duplicate) are analyzed. An in-house performance audit is analyzed at least quarterly to assure satisfactory method performance. Recoveries and duplicate results are monitored to demonstrate acceptable system performance.

All of the ten (10) sample surrogate recoveries were within the 60% - 150% advisory windows. Where possible, results were obtained from the lowest dilution available. In some cases, results were obtained from acid treated extracts in order to screen out interferences.

One (1) of the fourteen (14) quality control sample surrogate recoveries was outside the 60% - 150% advisory limits. The result for this recovery have been qualified "A".

All remaining quality control results were within the advisory limits.

Several soil samples required sample extract dilution due to matrix effects. In addition, all soil samples were analyzed following a mercury cleanup to remove sulfur interferences. Prior to pesticide analyses, screening analyses were performed following sulfuric acid cleanup in order to eliminate aliphatic interferences and aid in PCB identification.

SAMPLE VOLUMES AND NQL FACTORS

SAMPLE	VOLUME	NQL FACTOR (PEST)	NQL FACTOR (PCB)
95020602	1.000 L	1.000	1.000

$$\text{NQL FACTOR} = \frac{1\text{ L (Ideal Sample Vol)}}{\text{Actual Sample Vol (L)}} * \text{Ext.D.F.} * \frac{\text{Final Ext. Vol. (mL)}}{10\text{ mL (Ideal Final Vol)}} \quad \text{(Water)}$$

SAMPLE WEIGHTS AND NQL FACTORS

SAMPLE	WEIGHT	NQL FACTOR (PEST)	NQL FACTOR (PCB)
95020603	15.0 g	5.0	1.0
95020604	15.0 g	10.0	1.0
95020605	15.0 g	1.0	1.0
95020606	15.0 g	10.0	5.0

$$\text{NQL FACTOR} = \frac{30\text{ g (Ideal Sample Wt.)}}{\text{Actual Sample Wt. (g)}} * \text{Ext.D.F.} * \frac{\text{Final Ext. Vol. (mL)}}{10\text{ mL (Ideal Final Vol)}} \quad \text{(Soil)}$$

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ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

REGION 3
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Philadelphia, Pennsylvania 19107

CHAIN OF CUSTODY RECORD

PROJ. NO.: 4232-05
PROJECT NAME: KOPPERS

SAMPLERS: (Signature) Brian M. Marini, Shipping Assistance: John L. Spille and Eliz Rogers (EWRS)

STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION	NO. OF CONTAINERS	TCL Volatiles *	TCL Semi/Pest/PCBs (J)	TAL total Metals (J)	TAG #	REMARKS
TB-01	2/2/95	0900	✓	*	KOP-TB-01	3	✓		95020601	3-1155916	thru 3-1155918
FB-01	2/2/95	0900	✓	*	KOP-FB-01	8	✓	✓	95020602	3-1155919	thru 3-1155926
SB-701A	2/2/95	0935	✓	*	KOP-SB-701-SS	4	✓	✓	95020603	3-1155927	thru 3-1155930
SB-705A	2/3/95	0920	✓	*	KOP-SB-705-SS	4	✓	✓	95020604	3-1155939	thru 3-1155942
SB-701B	2/2/95	1000	✓	*	KOP-SB-701-8-10	4	✓	✓	95020605	3-1155931	thru 3-1155934
SB-705B	2/3/95	1030	✓	*	KOP-SB-705-6-8	4	✓	✓	95020606	3-1155935	thru 3-1155938

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Brian M. Marini	2/3/95 1700				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) Alice Jay Hall	Date / Time 2/6/95 8:40	Remarks: Fed Ex Airbill 3161976661	

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AR300650

3 23947

Region III, Central Regional Laboratory
Annapolis, Maryland

HAZARD AND RISK EXPOSURE DATA SHEET
LEVELS OF PERSONAL PROTECTION DURING SAMPLING

BACKGROUND

Under the authority of Section 104 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) of 1980, Section 311 of the Clean Water Act, and Subtitle I of the Resource Conservation and Recovery Act (RCRA), EPA has been delegated the responsibility to undertake response actions with respect to the release or potential release of oil, petroleum, or hazardous substances that pose a substantial threat to human health or welfare, or the environment.

GENERAL

This form is to be used when collecting Environmental Samples (i.e. streams, farm ponds, wells, soils etc.) and for Hazardous Samples (i.e. drums, storage tanks, lagoons, leachates, hazardous waste sites). This information is intended for use as a guide for the safe handling of these laboratory samples in accordance with EPA and OSHA regulations. The sample classification(s) and levels of personal protection used by the sampler in all situations will enable the analyst to be better aware of potential exposure to substances in air, splashes of liquids, or other direct contact with material due to work being done.

DEGREE OF PROTECTION

_____ Level A: Highest level of respiratory, skin, and eye protection needed.
Fully encapsulated suit, respirator self-contained (Tank type)

_____ Level B: Highest level of respiratory protection but lesser level of skin protection needed.
Chemical suit, respirator self-contained (Tank type)

_____ Level C: Lesser level of respiratory protection than Level B. Skin protection criteria are similar to Level B.
Chemical suit, cannister respirator/cartridge

X Level D: Work uniform without any respirator or skin hazards.
Lab coat, gloves etc.

(XX) I am not telling you what level of PPE to use this is the level used by the sampler.

CLASSIFIED FIELD SAMPLES Background soil samples (off site) for RI/FS

? X Environmental X Hazardous ___ Comb. (Env. & Haz.) ___ Radioactive

Site Name: Former Koppers Co. Facility Sampling Date: 2/2/95 - 2/3/95

Sta No. _____, _____, _____, _____, _____, _____, _____, _____, _____, _____

none Field pH: _____, _____, _____, _____, _____, _____, _____, _____, _____, _____
(must be taken prior to submission of aqueous samples) only FB and TB

Sampler: Brian Marini Work Phone Number: 302-738-7551

Personal observations at time of sampling (surroundings): Off-site locations. KOP-SB701-SS and KOP-SB701/8-10 are collected n. of rail line; clayey to sand. KOP-SB705-SS and 6-8 are fill material - No odors noted

Sample collection observations (physical sample, odors etc.) _____

TETRA TECH, INC.
56 WEST MAIN STREET
CHRISTIANA DE 19702-1551
TELEPHONE (302) 738-7551

February 8, 1995
TCN 4232-05

USEPA Central Regional Laboratory
Attn: Fay Hall
839 Bestgate Road
Annapolis, MD 21401

Dear Ms. Hall:

SUBJECT: MEMO TO FILE - USEPA REGION III, KOPPERS SITE SAMPLES
ARCS CONTRACT NO. 68-W8-0092, WORK ASSIGNMENT NO. 92-32-3P3C

Please note the following amendments to sampling paperwork for samples collected 2/1/95 through 2/3/95 (shipped to you on 2/3/95) via Fed Ex Airbill 3161976661.

- The Station Number was incorrectly listed as SB-705A on EPA sample tags 3-1155935 through 3-1155938; the correct Station Number should have been SB-705B as was listed on the COC# 3 23947.
- The COC#3 23947 incorrectly listed Total Metals for only one sample; this analysis should have been checked for all samples except for TB-01, as was indicated on the EPA sample tags and bottle labels.

Tetra Tech apologizes for any inconvenience this may have caused.

Sincerely,

Elizabeth W. Rogers

Elizabeth W. Rogers
Work Assignment Manager

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cc: Lisa Marino, USEPA RPM
Annette Lage, USEPA RSCC